UNIT II

RCM PROCESS

Module 2

PLANNING AND PREPARATION

PLANNING AND PREPARATION

Module Preview:

Introduction

- **Introduction**
- **RCM Planning and Preparations**
- **Review and Summary**

PLANNING AND PREPARATION

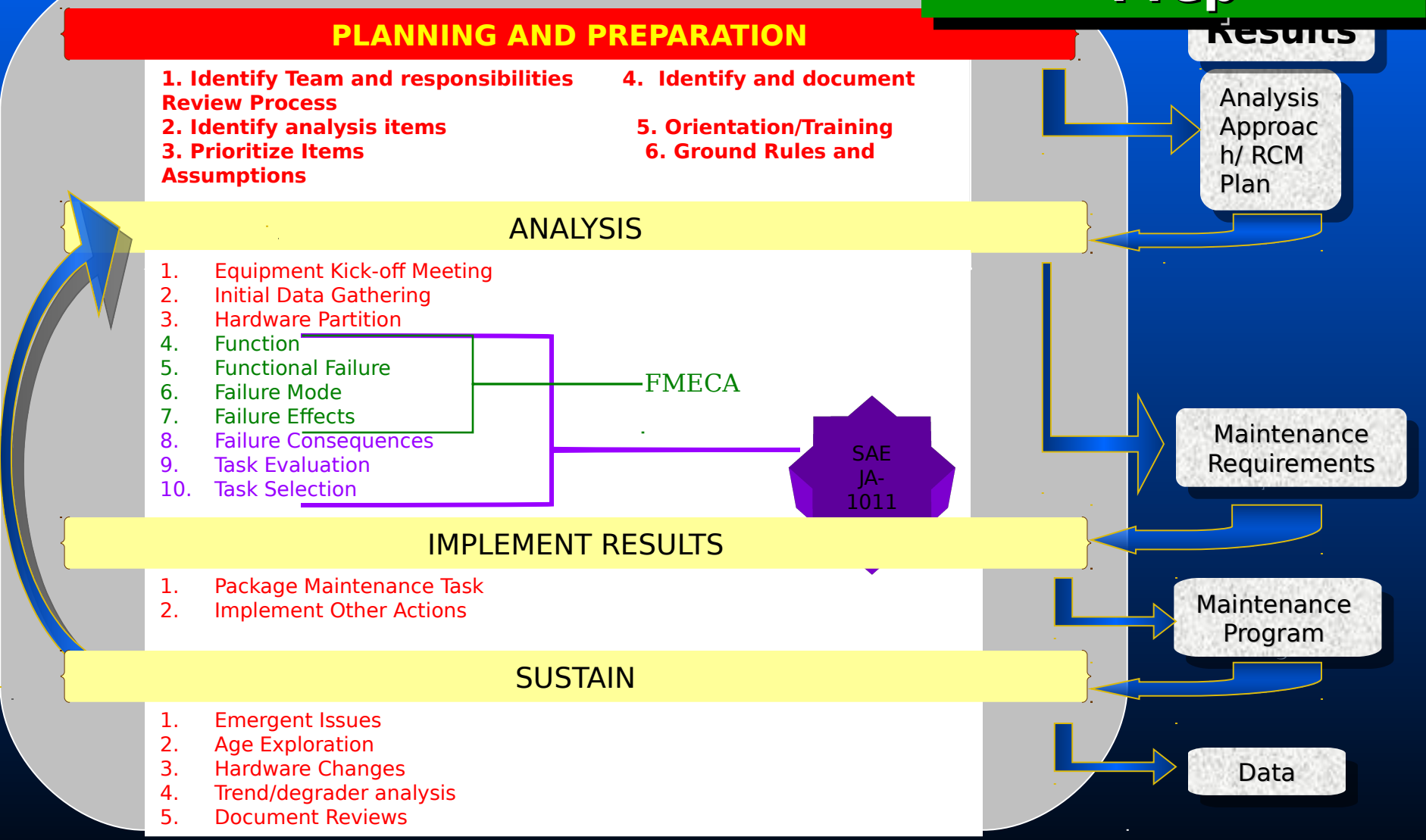
Module Objective:

Introduction

This module provides an overview of the elements that must be addressed prior to beginning an RCM analysis and how those issues affect the analysis.

RCM Process

Planning and Prep



PLANNING AND PREPARATION

Steps:

Planning and Prep

1. Identify the RCM Team and responsibilities
2. Identify the Items subject to Analysis
3. Prioritize Analysis Items
4. Identify and document the analysis review and approval process
5. Project Orientation Brief/Training
6. Develop Analysis Ground Rules & Assumptions

PLANNING AND PREPARATION

Step1:

Planning and Prep

Step 1: Identify the RCM Team and responsibilities

- **Team composition**
  - ✓ **Operators**
  - ✓ **Maintainers**
  - ✓ **Engineering/Logistics/Safety/SME**
  - ✓ **Data Managers/Analysts**
  - ✓ **RCM Analysts (may be one or more of above or separate)**
  - ✓ **Project Manager/RCM Implementation Manager/Facilitator (one of above or separate)**
- **Responsibilities**
  - ✓ **Support roles (subject matter expertise)**
  - ✓ **Analysis and documentation**
  - ✓ **Data collection**
  - ✓ **Review and approval**
  - ✓ **Implementation**
- **Team Availability and Interface**
- **Analysis structure (facilitated group or assigned analyst)**

PLANNING AND PREPARATION

Step 2:

Planning and Prep

Step 2: Identify Analysis Items

- List the upper level item or items that will be analyzed
- May be an entire asset or a list of equipment/systems
- Include boundaries if necessary
- Be specific

Examples of analysis items:

- E-6 aircraft
- Sea-wolf Submarine
- Plant water supply System (including well, pumps, and piping up to main shut-off valve)
- Water-jet cutting machine and Milling Machine
- Soot Blowing System, Absorber Tower System, and Boiler Air and Gas System

PLANNING AND PREPARATION

Step 3:

Planning and Prep

Step 3: Prioritize Analysis Items (Analysis scope)

- List the preferred order that upper level assets will undergo analysis
- Does not mean one item must be completed before another starts
- In the case of complex items such as an entire aircraft or major system, additional prioritization may be needed after hardware partitioning

PLANNING AND PREPARATION

Step 4:

Planning and Prep

Step 4: Identify and Document the Review and Approval Process

- Who is responsible for review and approval of each analysis
- Are reviews informal or formal, group or individual
- Review/Approval should include senior RCM analyst and system subject matter expert

PLANNING AND PREPARATION

Step 5:

Planning and Prep

Step 5: Project Orientation

- Objective is to begin the “buy-in” process and remove potential roadblocks
- Should include all personnel significantly affected by RCM results, including operations and management representatives
- Should include the following topics:
  - ✓ Items in step 1-4
  - ✓ General RCM process overview
  - ✓ What’s in it for everyone
  - ✓ What’s expected of everyone
  - ✓ Statement of management buy-in
  - ✓ Statement of key groups (maintenance, production) buy-in. (team member advocates)
- Formal analyst training only required for key participants

PLANNING AND PREPARATION

Step 6:

Planning and Prep

Step 6: Ground Rules & Assumptions (GR&A)

- A compilation of information required by RCM analysts to perform analysis
- Items included:
  - Description of operating environment (operating context)
  - Standard operating procedures
  - Data sources
  - Failure mode sources
  - Analytical methods
  - Cost-benefit analysis methods
  - Default Values
  - Acceptable probability of failure
  - Labor rates
  - Equipment usage rates

PLANNING AND PREPARATION

RCM Program Plan

Planning and Prep

RCM Projects should document the results of the planning and preparation steps into an *RCM Program Plan*

- **Scope and size of plan is dependent on project**
- **Ensures consistency of analysis process**
- **Establishes priorities and schedule**
- **Documents contributions of team members and concurrence by management**
- **Can be used for funding justification and to gain management support**

PLANNING AND PREPARATION

RCM Program Plan

Planning and Prep

RCM Program Plan Elements:

- Team and Responsibilities (Planning Step 1)
- Analysis scope (what and what order: Planning steps 2 and 3)
- Review and approval process (Planning Step 4)
- Training Requirements (Planning Step 5 +)
- Ground Rules and Assumptions (Planning Step 6)
- Sustaining task procedures
- Hazard Risk Matrix
- Metrics and Reporting requirements
- Funding requirements
- Plan of action and milestones
- Contractor support requirements

Deliverables

PLANNING AND PREPARATION

Team and Responsibilities

Planning and Prep

Facilitated approach vs. dedicated analyst

- Facilitated group approach
  - Analysis is performed during meetings of key personnel in presence of a facilitator
  - Maximizes buy-in from participants
  - Limited by amount of time key persons can attend meetings
  - Focuses on consensus of stakeholders vice detailed/analytical solutions

PLANNING AND PREPARATION

Team and Responsibilities

Planning and Prep

Facilitated approach vs. dedicated analyst

- Dedicated analyst
  - Analysis is performed by dedicated RCM expert(s) using information gathered from system experts and other sources
  - Still must include participation of key SMEs (operators/maintainers) for analysis to be effective
  - Less daily impact on non-RCM analyst participants
  - Participants don't need extensive RCM training, just basic orientation

PLANNING AND PREPARATION

Team and Responsibilities

Planning and Prep

Facilitated approach vs. dedicated analyst

Which is best?

Depends on desires and resources of each organization

PLANNING AND PREPARATION

Scope of Analysis:

Planning and Prep

Scope May be dependent on:

- **Funding/personnel resources/management commitment**
  - **Pilot project vs. full-scale**
- **Objectives of analysis**
  - **Fix current “headaches” vs. maintenance optimization**
- **“Age/Remaining planned Life” of analysis items**
  - **Potential risk vs. return**
- **Criticality analysis (Risk Indices) may be used to further prioritize or limit the analysis**

MUST ensure potential safety/environmental issues

are not overlooked in less than complete

PLANNING AND PREPARATION

RCM Training

Planning and Prep

Training Requirements (Planning Step 5 +)

- **Orientation**
  - Provided to significantly affected parties and participants early in the process
  - Essential in the dedicated analyst approach
  - Typically 2 – 4 hours
- **Analyst training**
  - Analyst approach: only required for those key individuals intimately involved in the analysis process
  - Facilitated approach: typically provided to all participants
  - Typically 3-5 days
- **Management overview**
  - Provided to key management to gain buy-in develop agreement on expectations
  - Typically 1-4 hours

PLANNING AND PREPARATION

Sustaining the RCM Analysis:

Planning and Prep

- **Defines how the RCM team plans to monitor and improve the effectiveness of the maintenance program throughout the life of the equipment**

- **RCM must be maintained over time to realize its full benefit**

RCM Sustainment is discussed in more detail in Unit IV

PLANNING AND PREPARATION

Review and Summary

- **Module Objective**
  - **Provide an overview of the issues that must be accomplished prior to beginning RCM analysis.**
- **Introduction**
  - **Learning Objectives**
- **Planning and preparation**
  - **Required Steps**
  - **RCM Plan**

End of Module

up next.....

Hardware Partitioning